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THE GROWTH AND CONTRIBUTION OF FEDERAL RECLAMATION TO AN EXPANDING NATIONAL ECONOMY

REPORT

BY

BUREAU OF RECLAMATION
DEPARTMENT OF THE INTERIOR

FOR THE USE OF THE

COMMITTEE ON INTERIOR AND INSULAR AFFAIRS
HOUSE OF REPRESENTATIVES

OCTOBER 1954

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LETTER OF TRANSMITTAL

DEPARTMENT OF THE INTERIOR,
BUREAU OF RECLAMATION,
Washington 25, D. C., October 20, 1954.

Hon. A. L. MILLER,
House of Representatives,
Washington 25, D. C.

MY DEAR DR. MILLER: In keeping with the suggestion contained in your letter dated July 27, 1954, I am pleased to transmit a report on "The Growth and Contribution of Federal Reclamation to an Expanding National Economy."

In brief this report shows in part that—

1. Reclamation has constructed or rebuilt facilities to furnish a full or supplemental irrigation water supply for 7.1 million acres of irrigable land. This translates into 125,000 family-size farms and an additional 125,000 suburban units.

2. Crop production in 1953 from 69 reclamation projects or major divisions was valued at $785.9 million and the cumulative value of crops produced from 1906 to 1953 totals almost $10 billion.

3. Net power revenues in fiscal year 1954 from 29 power plants now in operation, after deductions for annual operation, maintenance, and replacements, totaled $33.9 million and the total of all net power revenues returned to the Federal Treasury through June 30, 1953, amounted to about $225.9 million. Net power revenues during the next 50 years from 1953 at the level of fiscal year 1954 could return an additional $1,692.5 million to the Treasury.

4. Irrigation and municipal water repayment contracts will return $691 million, of which $108.9 million had been paid to June 30, 1953. While making construction account payments, the water users have paid operation and maintenance charges as they have become due. This will continue. Additional returns will accrue through water-sales-type contracts.

5. Potential returns to the United States Treasury from irrigation and municipal water users during the contract repayment period, plus the net power revenues from the presently operating facilities at the fiscal year 1954 level for the next 50 years will aggregate $2.6 billion, of which $334.8 million had been paid in on June 30, 1953. Power plants under construction will, when completed, add materially to these potential returns.

6. Federal tax revenues since 1916 from reclamation areas which may be attributed to Federal reclamation developments now stand at more than $3 billion. This sum alone exceeds by 25 percent the total cost of all Bureau-constructed projects to date.

7. Income to reclamation-project farmers and farm workers totaled $550 million in 1953 or a cumulative income since 1906 of $6.8 billion.

8. Income to nonfarm urban areas in the environs of reclamation projects in 1953 amounted to about $786 million and aggregates almost $10 billion.

9. Annual business activity attributed to fishing, hunting, and other recreation at reclamation reservoirs is estimated at about $33 million annually.

10. Western population has increased at a much greater rate during the last decade than has the population of the Eastern States. For example, the population of the 17 Western States increased 25.8 percent between 1940 and 1950 while the 31 Eastern States gained only 11.5 percent.

11. Per capita retail trade in the Western States exceeds that of the Eastern States.

12. Reclamation project construction results in increased shipments of materials, supplies, and equipment from east to west during construction.

13. With reclamation-project development, business activity as reflected by railway freight shipments increases from east to west and from west to east.

14. The value of plant, property, and equipment of all Reclamation projects, both completed and under construction to serve irrigation, power, municipal water, flood control, fish and wildlife, pollution abatement, salinity control, navigation and other public uses totaled $2.4 billion on June 30, 1953. This resource development expenditure over a period of more than 50 years is less than 4 percent of a single year's national budget. The fiscal year 1954 appropriations for reclamation construction was one-fourth of 1 percent of the national budget.

Your comments and suggestions regarding this report will be appreciated.

Sincerely yours,

W. A. DEXHEIMER, *Commissioner.*

THE GROWTH AND CONTRIBUTION OF FEDERAL RECLAMATION TO AN EXPANDING NATIONAL ECONOMY

ORIGIN OF IRRIGATION

The early man of the Mediterranean area was nomadic, wresting his requirements for food, clothing, and shelter from the plants and animals living in the area through which he traveled. A great drought probably forced man and the animals of the area into the valleys of the major rivers. Here he learned to domesticate the animals, grow crops, and live in a primitive community.

It was in the valleys of the Tigris and Euphrates and the Nile that he changed from a hunter to a herdsman, from a food garnerer to a food grower. Here he started the processes from which our western civilization evolved.

It was in these river valleys that he first learned to use the waters of the rivers to sustain his crops and later to exercise control over the rivers by crude irrigation structures. From its apparent origin along the rivers of the Near East, the practice of irrigation spread with the movement of the world's population eastward to India and China and westward through Europe.

The early civilization of Chile, Peru, Mexico, and the Indian Pueblos of the Southwestern United States was based on irrigated agriculture. At the time of the Spanish explorations into Arizona, New Mexico, and Colorado, the practice of irrigation was well established. During the age of exploration and conquest, however, irrigation on the North American Continent virtually vanished.

HISTORY OF IRRIGATION IN THE UNITED STATES

The Anglo development of irrigation in the United States remained insignificant until 1847, when Brigham Young and his Mormon pioneers diverted water from the stream they named City Creek to irrigate their gardens and fields on land now occupied by Salt Lake City.

In 1879 Congress established the Geological Survey in the Department of the Interior and authorized surveys to determine the settlement opportunities of lands that could be irrigated in the Western States.

The move toward reclaiming the arid West was given additional impetus by the passage of the Carey Act in 1894. This act was designed to aid public-land States in the reclamation of desert lands and in their settlement, cultivation, and sale to actual settlers. In the 8 years of operation of the Carey Act, only moderate success was attained and public-land grants amounted to less than 1.1 million acres. Four States eligible to file under the provisions of the act made no application for its benefits.

The importance of irrigation in the West first assumed major political attention in 1900, when all three major parties included in their platforms pledges for the rapid development of irrigation in the West.

In 1901 President Theodore Roosevelt enunciated certain far-reaching policies with respect to irrigation. In his message, among other things, he said:

> The reclamation and settlement of the arid lands will enrich every portion of our country, just as the settlement of the Ohio and Mississippi Valleys brought prosperity to the Atlantic States.

On June 17, 1902, President Theodore Roosevelt signed into law the first Reclamation Act authorizing the Secretary of the Interior to investigate, construct, and operate Federal reclamation projects. Under this basic act the construction costs were to be repaid by the water users, and public lands on the projects were to be made available under homestead laws in family-size farms.

From time to time, Congress has amended and supplemented this basic law to reflect changing economic conditions and bring into recognition, under Federal reclamation law, hydroelectric power, flood control, municipal and industrial water, recreation, navigation, and other service aspects of the multiple-purpose water-conservation construction. Federal cooperation with local groups in the development of land and water resources and the creation thereby of family-size farms has been a continuing national policy.

The new reclamation program received immediate support, and by 1905 water deliveries had already started on the Newlands project in Nevada, and within 10 years of the passage of the Reclamation Act, facilities had been completed by which water deliveries could be made to 1.2 million irrigable acres on 24 projects.

INVENTORY OF FEDERAL RECLAMATION SERVICES

Irrigation

The 69 irrigation projects or major divisions constructed by the Government or receiving water through Government-constructed works are scattered over 17 Western States and completed to the point where full or supplemental irrigation supplies are available to 7,147,528 irrigable acres. Approximately two-fifths of this area is furnished a full irrigation water supply and about three-fifths a supplemental water supply.

This development is the result of a continuing reclamation program which was initiated in 1902. The following table shows the acreage in 1906, the first year crops were harvested from a Federal reclamation project, then at 10-year intervals, and 1953:

Irrigable land under completed works

	Acres		*Acres*
1906	39,300	1936	3,693,417
1916	1,405,452	1946	5,150,831
1926	3,173,570	1953	7,147,528

These lands are in every climatic zone of the West and with variations in elevations from five and six thousand feet to below sea level. The agricultural developments range from the hay- and pasture-producing projects of the high mountain areas to the intensified

production of off-season and winter vegetables and semitropical fruits in the Southwestern States. Except for cotton, potatoes, and some wheat for milling purposes, the production from these irrigated areas is noncompetitive with dry-land agricultural production of the country.

The 1949 census of irrigation, conducted by the Department of Commerce, shows that the irrigable land on Federal reclamation projects was about 23 percent of the irrigated land in the Western States and 21 percent of the total for the Nation. This report will deal only with the features of Federal reclamation projects.

There were in 1953 about 125,000 family-size farms and an equal number of suburban units receiving water through reclamation projects. On the projects there were 417 towns with a population of over 1,643,000. Considering power, municipal and industrial water and irrigation, considerably more than 5 million people in the service areas of Reclamation projects obtain their living directly or indirectly by reason of the project development.

Small projects

The spectacular size of dams like Grand Coulee on the Columbia River, Hoover on the Colorado River, Shasta on the Sacramento River, and Hungry Horse on the Flathead River kindles the imagination and creates the illusion that projects built by the Bureau of Reclamation are devoted entirely to the gigantic or spectacular and that the Federal reclamation program would not be adapted to the small simple irrigation project.

Actually, the reverse is true. While the engineering skills developed in the Bureau have been demonstrated to be adequate to attack and solve problems such as those attending the construction of Hoover Dam, the world's tallest; or drilling of the Alva B. Adams Tunnel on the Colorado-Big Thompson project, the country's longest; or the building of river-size canals like those constructed in the Central Valley of California, or the Columbia Basin project in Washington, most of the Bureau-built projects are small in size and involve relatively simple engineering structures.

Of the 69 projects or major divisions constructed or rehabilitated by the Bureau, 9, for example, provide full or supplemental water to projects of less than 5,000 irrigable acres. An additional 22 projects serve less than 25,000 acres each, and all but 14 serve less than 100,000 acres. In recent years much attention has been given to cooperative effort with small irrigation districts, and techniques have been evolved which are particularly effective in dealing with the rehabilitation, reconstruction, and betterment of irrigation projects built many years ago under private initiative.

Typical of this group are the Fort Sumner project in New Mexico, and the Lewiston Orchards project in Idaho. The first of these contains 6,500 irrigable acres and calls for the diversion of not to exceed 100 cubic feet of water per second from the Pecos River in New Mexico for irrigation. The rehabilitation program called for the relocation and rebuilding of the diversion dam and the rehabilitation or reconstruction of canals, pumping plants, and drainage canals. This project supplies water to 205 farms and is the principal support for a population of about 2,650 people.

The second of these projects provides water for 3,524 acres and in addition serves approximately 1,800 domestic water users. This

called for the construction of a completely new underground distribution system and the rehabilitation of dams, feeder canals, and other project works. In all, some 6,000 people are affected by the project.

The following table shows the acreage of major classes of crops, the production and their value from all projects constructed by the Bureau of Reclamation or receiving water from Bureau-constructed works in 1953:

Comparative summary of acreages in cultivation and gross crop values, 1952 and 1953

Project	Net area in cultivation		Total gross crop values		Average value per acre	
	1952	1953	1952	1953	1952	1953
	Acres	*Acres*				
Arnold, Oreg	2,712	2,686	$217,824	$227,849	$80.32	$84.83
W. C. Austin, Oklahoma	43,735	46,831	5,414,603	1,683,913	123.80	35.96
Baker, Oreg	7,305	7,305	275,380	210,500	37.70	28.82
Balmorhea, Tex	8,535	7,782	1,006,067	934,843	117.88	120.13
Belle Fourche, S. Dak	53,725	54,206	2,459,125	1,374,103	45.77	25.35
Bitter Root, Mont	16,482	16,517	655,250	496,323	39.76	30.05
Boise, Idaho-Oreg	319,366	322,500	32,935,422	25,302,614	103.13	78.46
Boulder Canyon, Calif.: All-American Canal system:						
Coachella division	36,989	47,370	19,213,773	14,363,118	519.45	303.21
Imperial division	440,000	445,000	93,394,738	85,543,780	212.26	192.23
Buffalo Rapids, Mont	23,968	24,158	1,337,420	1,048,635	55.80	43.41
Buford-Trenton, N. Dak	9,499	9,331	477,008	330,028	50.22	35.37
Burnt River, Oreg	15,240	15,240	590,560	434,100	38.75	28.48
Carlsbad, N. Mex	24,338	23,108	4,651,561	3,318,191	191.12	143.59
Central Valley, Calif	587,915	634,103	152,208,532	136,269,346	258.90	214.95
Colorado-Big Thompson, Colo	615,000	615,000	72,366,992	59,237,730	117.67	96.32
Columbia Basin, Wash	27,061	65,292	4,686,885	9,049,631	173.20	138.60
Deschutes, Oreg	90,401	90,781	13,524,101	9,762,801	149.60	107.54
Fort Sumner, N. Mex	5,065	5,368	608,703	508,597	120.18	94.75
Frenchtown, Mont	3,093	3,871	181,871	171,340	58.80	44.26
Fruitgrowers Dam, Colo	2,060	2,078	350,633	178,483	170.21	85.89
Gila, Ariz	32,573	43,991	6,417,065	9,044,945	197.01	205.61
Grand Valley, Colo	38,084	37,319	5,525,647	5,566,058	145.09	149.15
Grants Pass, Oreg	7,241	6,946	854,156	901,910	117.96	129.85
Humboldt, Nev	25,365	29,363	2,532,708	1,940,291	99.85	66.08
Huntley, Mont	25,310	25,487	1,766,413	1,453,630	69.79	57.03
Hyrum, Utah	5,719	5,684	370,128	341,161	64.72	60.02
Intake, Mont	523	573	22,068	18,395	42.20	32.10
Kendrick, Wyo	11,407	11,966	433,327	403,551	37.99	33.72
Klamath, Oreg.-Calif	189,630	197,101	30,904,804	19,362,612	162.97	98.24
Lewiston Orchards, Idaho	2,576	2,234	518,349	576,399	201.22	258.01
Lower Yellowstone, Mont.-N. Dak	50,325	49,111	3,142,636	2,661,829	62.45	54.20
Mancos, Colo	7,688	7,588	283,434	210,143	36.87	27.69
Milk River, Mont	70,665	70,458	3,972,811	2,159,708	56.22	30.65
Minidoka, Idaho-Wyo	1,004,435	1,012,605	115,106,077	81,094,272	114.60	80.08
Mirage Flats, Nebr	11,282	11,312	1,167,623	1,164,207	103.49	102.92
Missoula Valley, Mont	601	770	15,336	17,195	25.52	22.33
Missouri River Basin:						
Bostwick division: Superior-Courtland unit, Nebraska	2,238	4,376	209,539	307,642	93.63	70.30
Cheyenne division: Angostura unit, South Dakota	0	5,166	0	106,886	0	20.69
Frenchman-Cambridge division, Nebraska	4,665	10,390	448,785	620,017	96.20	59.67
Heart division: Heart Butte and Dickinson units, North Dakota	174	357	16,411	19,562	94.32	54.80
Yellowstone division: Savage unit, Montana	2,015	2,015	78,791	60,782	39.10	30.16
Moon Lake, Utah	58,796	58,796	1,492,166	1,012,548	25.38	17.22
Newlands, Nev	53,458	54,128	3,418,551	2,267,116	63.95	41.88
Newton, Utah	1,893	1,918	130,133	124,257	68.74	64.78
North Platte, Nebr.-Wyo	340,569	335,419	34,677,991	30,532,805	101.82	91.03
Ochoco, Oreg	7,985	8,292	1,509,671	489,887	189.06	59.08
Ogden River, Utah	16,132	16,266	1,778,315	1,690,888	110.24	103.95
Okanogan, Wash	3,938	3,894	1,602,578	1,417,087	406.95	363.92
Orland, Calif	17,200	17,261	1,837,022	1,600,864	106.80	92.74
Owyhee, Oreg-Idaho	112,780	111,498	19,832,480	10,116,222	175.85	90.73

Comparative summary of acreages in cultivation and gross crop values, 1952 and 1953—Continued

Project	Net area in cultivation		Total gross crop values		Average value per acre	
	1952	1953	1952	1953	1952	1953
	Acres	*Acres*				
Paonia, Colo	10,800	9,070	$1,006,435	$568,364	$93.19	$62.66
Pine River, Colo	33,300	34,690	1,032,058	820,611	30.99	23.68
Pine River Indian irrigation, Colorado	9,660	9,780	240,881	223,424	24.94	22.84
Preston Bench, Idaho	4,704	4,181	388,319	373,622	82.55	89.36
Provo River, Utah	40,056	40,488	4,602,531	3,463,459	114.90	85.54
Rapid Valley, S. Dak	7,470	7,211	257,356	184,779	34.45	25.62
Rathdrum Prairie, Idaho-Wash	3,224	3,460	273,993	280,203	84.99	80.98
Rio Grande, N. Mex.-Tex	175,968	178,228	63,285,895	42,954,277	359.64	241.01
Riverton, Wyo	55,186	56,687	2,598,098	2,302,335	47.08	40.61
Salt River, Ariz	305,657	306,047	84,161,154	79,875,616	275.35	260.99
Sanpete, Utah	12,911	12,911	469,274	565,891	36.35	43.83
Scofield, Utah	14,868	15,009	1,170,272	826,877	78.71	55.09
Shoshone, Wyo.-Mont	77,972	77,874	4,676,409	3,850,611	59.98	49.45
Strawberry Valley, Utah	41,164	41,475	2,640,412	2,753,425	64.14	66.39
Sun River, Mont	75,044	85,416	3,144,395	2,121,433	41.90	24.84
Truckee Storage, Nev.-Calif	22,990	22,986	2,344,675	1,628,864	101.99	70.86
Tucumcari, N. Mex	33,755	35,783	2,323,101	1,715,542	68.82	47.94
Umatilla, Oreg	22,662	24,913	1,595,231	1,632,506	70.39	65.53
Uncompahgre, Colo	71,232	74,633	5,557,325	4,389,980	78.02	58.82
Vale, Oreg	31,630	31,484	2,450,555	1,818,956	77.48	57.77
Weber River, Utah	91,016	90,914	11,215,871	9,229,823	123.23	101.52
Yakima, Wash	385,696	387,310	73,491,041	77,487,529	190.54	200.07
Yuma, Ariz.-Calif	59,370	58,973	19,088,789	18,551,781	321.52	314.58
Yuma Auxiliary, Arizona	2,263	2,112	1,044,222	561,166	461.43	265.70
Grand total	6,026,354	6,192,416	935,679,755	785,939,868	155.26	126.92

Source: Department of the Interior Bureau of Reclamation.

Hydroelectric power

For optimum development, control, and use of water resources, Federal reclamation multipurpose works are being constructed to serve irrigation, power, municipal water, flood control, navigation, fish and wildlife, recreation, pollution abatement, and other purposes. The inclusion of revenue-producing power facilities permits the construction of projects greater in cost than the repayment ability of the irrigation water users ordinarily would allow.

Seventeen multipurpose reclamation projects with power facilities had been placed in operation by the end of fiscal year 1954. These projects have 29 powerplants in operation with a nameplate capacity of 4.72 million kilowatts, almost 9,000 circuit miles of transmission lines, and nearly 300 substations.[1] The transmission lines are primarily to connect with power distribution systems of cooperative, municipal, or private organizations.

The sale of electric energy from these 29 plants in fiscal year 1954 totaled 24.5 billion kilowatt-hours, an amount sufficient to supply a city of about 7 million people. The net revenues from the sale of this energy, after providing for operation and maintenance costs and replacements, totaled in fiscal year 1954 almost $33.9 million for return to the United States Treasury.

Rates are established to return the Federal investment allocated to power plus 2½ percent interest (3 percent on older projects) in the

[1] Includes transmission lines and substations for marketing power produced in Missouri River Basin from projects constructed by the Corps of Engineers.

first 50 years of operation of each plant. The cumulative net revenue to June 30, 1953, from the 29 plants totaled almost $226 million and during the next 50 years, at rates equivalent to fiscal year 1954, could return net revenues of approximately $1.7 billion. However, when they are integrated with plants now under construction by the Bureau of Reclamation and the Corps of Engineers, the operating efficiency and revenue-producing qualities will be improved.

The following tabulation shows by projects the nameplate capacity of the powerplants.

Hydroelectric plants on reclamation projects, constructed and operated by Bureau of Reclamation, as of June 30, 1954

State	Project	Name of plant	Calendar year of initial operation	Nameplate capacity (kilowatts)	
				Existing	Ultimate
1. Arizona-Nevada	Boulder Canyon	Hoover [1]	1936	1,249,800	1,354,300
2. Arizona-Nevada	Davis Dam	Davis	1951	225,000	225,000
3. Arizona-Nevada	Parker	Parker	1942	120,000	120,000
4. California	Central Valley	Keswick	1949	75,000	75,000
5. California	do	Shasta	1944	379,000	379,000
6. California	Yuma	Siphon Drop	1926	1,600	1,600
7. Colorado	Colorado-Big Thompson	Estes	1950	45,000	45,000
8. Colorado	do	Flatiron	1954	71,500	71,500
9. Colorado	do	Green Mountain	1943	21,600	21,600
10. Colorado	do	Marys Lake	1951	8,100	8,100
11. Colorado	do	Polehill	1954	33,250	33,250
12. Idaho	Boise	Anderson Ranch	1950	27,000	40,500
13. Idaho	do	Black Canyon	1925	8,000	8,000
14. Idaho	do	Boise diversion	1912	1,500	1,500
15. Idaho	Minidoka	Minidoka	1909	13,400	13,400
16. Montana	Missouri River Basin	Canyon Ferry	1953	50,000	50,000
17. Montana	Hungry Horse	Hungry Horse	1952	285,000	285,000
18. New Mexico	Rio Grande	Elephant Butte	1940	24,300	24,300
19. South Dakota	Missouri River Basin	Angostura	1951	1,200	1,200
20. Washington	Columbia Basin	Grand Coulee	1941	1,974,000	1,974,000
21. Washington	Yakima	Prosser	1932	2,400	2,400
22. Wyoming	Kendrick	Seminoe	1939	32,400	32,400
23. Wyoming	Missouri River Basin	Boysen	1952	15,000	15,000
24. Wyoming	do	Kortes	1950	36,000	36,000
25. Wyoming	North Platte and Missouri River Basin,	Guernsey	1927	4,800	14,800
26. Wyoming	North Platte	Lingle	1919	1,400	1,400
27. Wyoming	Riverton	Pilot Butte	1925	1,600	1,600
28. Wyoming	Shoshone	Heart Mountain	1948	5,000	5,000
29. Wyoming	do	Shoshone	1922	5,600	5,600
Total				4,718,450	4,846,450

[1] Powerplant units operated by power allottees under agency contract.

Municipal and industrial water

The history of water use on reclamation projects shows that as project water became available farmers immediately began using it for domestic purposes. As towns were established in the project area they too used the available project water for municipal purposes. It is estimated that 2 percent of all reclamation-project lands are now in urban development.

As towns adjacent to projects increased in size, many exhausted or outgrew their initial supply and looked to the water stored for irrigation as a solution to their municipal water problem. From this natural situation a close relationship evolved in the development of water resources for irrigation and municipal use. There are now about 56 urban areas under contract to receive project water for municipal purposes.

Municipalities obtaining a municipal, industrial, or miscellaneous water supply from Federal reclamation projects

State	Project	Municipality
Arizona	Salt River	City of Phoenix.
Do	Yuma	City of Yuma (Arizona Edison Co.).
California	All-American Canal	City of San Diego.
Do	Central Valley	Summit City.
Do	do	Shasta Dam Area Public Utility District.
Do	do	Contra Costa County Water District.
Do	Parker Dam	Metropolitan Water District of Southern California, including—
		Anaheim.
		Beverly Hills.
		Burbank.
		Costal Municipal Water District.
		Compton.
		Fullerton.
		Glendale.
		Long Beach.
		Los Angeles.
		Pasadena.
		San Diego County Water Authority.
		San Marino.
		Santa Ana.
		Santa Monica.
		Torrance.
		West Basin Municipal Water District.
Do	San Diego aqueduct	San Diego County Water Authority.
Do	Santa Barbara County	City of Santa Barbara.
Colorado	Colorado-Big Thompson	City of Estes Park.
Idaho	Lewiston Orchards	City of Lewiston.
Do	Minidoka	City of Burley.
Do	do	City of Acequia.
Do	do	City of Heyburn.
Montana	Lower Yellowstone	City of Savage.
Do	do	City of Fairview.
Do	do	City of Sidney.
Do	Milk River	City of Havre.
Do	do	City of Chinook.
New Mexico	Tucumcari	City of Tucumcari.
North Dakota	Missouri River Basin	City of Dickinson.
Oklahoma	W. C. Austin	City of Altus.
South Dakota	Belle Fourche	Town of Vale.
Do	do	Town of Newell.
Do	Rapid Valley	Rapid City.
Texas	Rio Grande	City of El Paso.
Utah	Ogden River	City of Ogden, city of Brigham, North Ogden.
Do	do	South Ogden Conservation District.
Do	Provo River	Salt Lake City.
Do	do	City of Provo.
Do	do	City of American Fork.
Do	do	City of Orem.
Do	do	City of Pleasant Grove.
Do	do	City of Linden.
Do	do	City of Lehi.
Washington	Yakima	City of Yakima.
Do	do	City of Cle Elum.
Do	do	Chelminar Grotto Association.
Wyoming	North Platte	City of Casper.
Do	Shoshone	City of Powell.

Under the present concept of comprehensive water-resource development, the planning of a new Federal reclamation project includes the present and potential water needs of all cities and towns in the area. An allocation of water storage is made for this high priority under state law, use as a part of the multiple-purpose features whenever the municipalities wish to participate.

In a letter to the Secretary of the Interior on May 26, 1954, regarding the establishment of a Cabinet Committee on Water Resources Policy, President Eisenhower stated, in part:

> The conservation and use which we make of the water resources of our Nation may in large measure determine our future progress and the standards of living of our citizens. If we are to continue to advance agriculturally and industrially we must make the best use of every drop of water which falls on our soil, or which

can be extracted from the oceans. It is my desire that this administration furnish effective and resourceful leadership in establishing national policies and improving the administrative organization needed to conserve and best utilize the full potential of our water resources.

Flood control

The first reclamation projects were constructed for irrigation water storage without thoughtful consideration of the flood-control needs of downstream areas. Under the present-day multipurpose concept of water-resource development, it is recognized that with a small additional cost, and with minor modification in the operating plant, many projects can provide much needed protection from floods.

The worst flood in California history occurred in November 1950, causing damage estimated at $10 million. The loss would have been much greater had not the Shasta, Friant, and other dams held back the waters of the melting snow pack from the high Sierras. Water that could have been a destructive force was held in storage for irrigation use and for generation of power for the benefit of the people.

In like manner, the operation of the dams on the Columbia River saved an estimated $5.5 million in flood damage in June and July of 1950.

Each of the reclamation storage reservoirs holds back water for beneficial use which, if not controlled, could destroy property and life.

Recreation and fish and wildlife

Recreational benefits of Federal reclamation projects are conservatively estimated at over $33 million a year. However, the total value of human enjoyment of the outdoor recreation provided by project developments cannot be calculated.

It has been estimated that 6,500,000 annual visitors enjoy recreation on the more than 100 reclamation reservoirs and that half of these visitors are tourists and sightseers coming from every State in the Union. If the tourists and sightseers spend $6 a day for food, lodging, and other items, the total business created would be over $19 million a year.

Estimates by the United States Fish and Wildlife Service and other data show that fishermen spent 750,000 angler-days each year on 50 of the hundred-and-odd reclamation reservoirs and caught about 3 million pounds of fish. An assumption that the other 50 reservoirs were fished only one-half as much would indicate a total of more than 1.1 million angler-days of fishing pleasure.

An expenditure by fishermen of $10 a day for gas, oil, boat hire, tackle, bait, etc., would create a local market of over $11 million a year.

To count the hunters and to measure the game bagged annually as a result of the improvement of wildlife habitat due to reclamation development would be a difficult and costly job. Reservoir areas, canal rights-of-way, and irrigated fields provide good cover and forage for many kinds of small game, with greatly improved conditions for game propagation. Observations on various projects indicate the public is taking full advantage of this new or improved recreational dividend from project development. An estimate of 300,000 hunter-days for all types of hunting on all reclamation projects appears conservative, inasmuch as it was estimated in 1951 that pheasant hunters spent 170,000 hunter-days on 19 projects. An expenditure by each

hunter of $10 per day for trip expenses and equipment, would indicate the creation of about $3 million of business annually. No estimate has been made of the value of the fish, waterfowl and upland game.

Other

In addition to the above specific services received Reclamation project facilities have (1) provided salinity control, (2) aided in the abatement of pollution, (3) assisted in the fulfillment of international obligations, (4) controlled streams in the interest of navigation and provided numerous other services of benefit to the people of the Nation.

THE ROLE OF FEDERAL RECLAMATION IN WESTERN DEVELOPMENT

From the day in 1847 when the Mormons first diverted the waters of a creek to their fields, irrigation has been a part of the development of the West. In many cases, small irrigation enterprises grew to large projects. People created on the desert or in the mountain valley first a village, then a town, and now a city, with processing, shipping, manufacturing, industries, churches, schools, hospitals, and banks, and the numerous other facilities and services common to a modern urban center.

The irrigated land may seem lost among the modern improvements, but year after year crops have been grown to sustain the economy of the area. Reclamation, both Federal and private, along with grazing, mining, forest production, and transportation have constituted the economic base upon which the West has been built.

The story of any major reclamation area in the Western States is a story of a humble beginning of a few irrigated farms from which an economic giant has grown. No one would claim that irrigation alone created these giants, but it is not accidental that each started where man came to grow crops and developed the water resources.

RECLAMATION'S CONTRIBUTION TO THE LOCAL ECONOMY

Farmer and farm workers

Based on national census data and studies of 6 widely scattered Federal reclamation projects, the income received by farm operators, owners, and laborers is about 70 percent of the value of crops produced. For all reclamation projects, this totaled about $550 million in 1953.

On the irrigated area around Payette, Idaho, the income to all farm labor, management, and property for 1949 was computed to be 96 percent of the gross value of crops produced. This high ratio of income to value of crops results in part by the marketing of grain and forage crops through livestock.

A study made on the Newlands project, Nevada, for 1948 and 1949 shows that because most crop production was marketed through livestock, greatly increasing its value, the income to farmers, farm labor, management, and to property was about equal to the value of crops produced.

The W. C. Austin project, Oklahoma, providing a partial irrigation water supply to an established dryland agricultural area, appears to have created an increase in farm labor, management, and property income equal to 79 percent of the additional value of crops produced

by irrigation in 1952; and on the Carlsbad project, New Mexico, in 1947 and 1948, this income was computed at 55 percent of the gross value of crops produced.

A University of California study of the Klamath project, Oregon-California, shows the net labor and investment income to farmers in 1948 to be 40 percent of the value of crops produced, and that an amount equal to about 20 percent of the gross crop value was paid to farm labor for a total of 60 percent for labor, management and capital.

For the Yuma project, Arizona-California, and the Gila project in Arizona, the total income to farm labor, management, and property was about half of the gross value of crops in 1949.

Based on these sample studies, it appears reasonable to assume that farm labor, management, and property income is at least 70 percent of the gross value of crops grown on Federal reclamation projects.

Local urban trade area

Independent studies of the environs of six widely scattered projects indicate the income to labor and capital in the local project trading area is about equal to the value of crops produced on the project. This urban income is estimated at $786 million for 1953 for all Federal reclamation projects.

The urban trade created by project crop production comes from processing, shipping, marketing, and associated activities required to move the crop to market. Dairy products and fruits and vegetables obviously require more local economic activities than the shipment of grains or cotton. The local trade area also benefits by providing goods and services required by farmers, farm laborers, and all those whose income is derived directly or indirectly by reason of project development.

A study of the contribution of irrigated crop production to the economic life of the city of Payette, Idaho, shows this urban or nonfarm income in 1949 to be 123 percent of the value of crops grown. This is the nonfarm local urban income created by the basic production of crops on the project lands.

A study of the contribution of the Newlands project, Nevada, to the local trade area shows that additional nonfarm income created by project production was 120 percent of the value of crops produced in 1949.

The increased crop production due to local nonfarm income in Altus, Okla., has been calculated to be about 80 percent of the gross value of the increased crop production due to irrigation in 1952 on the W. C. Austin project, Oklahoma.

A similar study covered the contributions of the crop production of the Carlsbad irrigation project in New Mexico to the local economy of the city of Carlsbad for the years 1947 and 1948. This study shows the local nonfarm income created by the project production to be 160 percent of the gross value of crops produced.

A study of the 1948 and 1949 economic conditions on the Yuma project, Arizona-California, and the Gila project, Arizona, shows the local nonfarm business, labor, and property income was about 70 percent of the gross value of crops produced.

Based on these studies, it seems reasonable to assume that crop production of irrigation projects creates in the urban area net income to labor, management, and capital equal to the gross value of crops produced. Thus, local urban nonfarm income created by the 1953 crops produced on all Reclamation projects was about $786 million.

Summary of income created by projects at local level

Based on the foregoing analysis, it seems reasonable to assume that the total of both farm and nonfarm income to labor, management, and property resulting from the 1953 production on Federal irrigation projects was more than $1.3 billion.

The Salt River project, which represents a total Federal investment of about $26.7 million offers an ideal case study of the benefits of reclamation to the country and at the same time provides another Horatio Alger's theme on a magnificent scale, not the rise of an individual, but of a community of over one-third of a million people.

At the turn of the century, Phoenix was a village in the desert. Today it is a metropolis and the heart of the Salt River project, one of the most highly developed agricultural areas in the United States.

The gross value of crops produced on the project during 1953 was $79,875,616. Since the first irrigation water was supplied in 1909, the cumulative value of crops harvested through 1953 amounted to $1,187,021,331. This wealth production is evidenced perhaps the most readily through its influence on retail sales, bank clearings, and Federal taxes.

Retail sales from Maricopa County totaled $468,637,000, volume of bank clearings in Phoenix reached $3,229,375,000, and Federal taxes from Maricopa County were estimated at $69,400,000, all during 1951. Much of this business activity was created in the processing, shipping, and marketing of the project's production, and in providing goods and services required by farm owners, operators and laborers and by all those whose income is derived from the production of the project.

RECLAMATION'S CONTRIBUTION TO THE NATIONAL ECONOMY

Trade creating aspects of irrigation

There are two major trade-creating aspects of reclamation projects affecting the economy beyond the local project trading area.

First, the crop and livestock products shipped out of a project area create income in transportation, processing, milling, spinning, weaving, manufacturing, wholesaling, financing, retailing, and all other processes between farm products and the ultimate consumer.

Consider the business-creating activities of a bale of cotton produced on the Rio Grande or Balmorhea projects in Texas as it becomes cotton clothing purchased in Maine or Wisconsin; or the processes between the cottonseed and the thousand uses to which this oil crop may eventually be placed. A Yakima, Wash., pear may appear in a salad in Chicago, and Salt River Valley grapefruit or lettuce on a Pittsburgh table. The milk and cream produced at Twin Falls, Idaho, may be butter used in Boston or cheese in St. Louis.

Every State in the Nation shares the health-giving benefit of protective foods produced on reclamation projects. A steer fed on the

North Platte project may be finished in Iowa, butchered in Chicago, and eaten in Detroit or New York. The trade-creating aspects of the production of a reclamation project goes deep into the national economy.

In 1953, Federal reclamation projects produced 25.7 million tons of farm crops. If this were all moved by rail, it would require 734,286 35-ton railway cars. End to end this would represent a train 6,258 miles in length—more than twice the distance from the Atlantic to the Pacific coast. This production valued at the farm was worth $785.9 million. When it reached its final use as processed food or manufactured clothing, it was far from home and its value was many times that received by the farmer.

An attempt was made to follow the production of the Carlsbad project, New Mexico, through to the ultimate consumer and to measure the increase in labor, management, and property income it created. It was found that the new labor, management, and property incomes over all other costs beyond the project area were about 3.2 times the value of the crops as they left the farm. Crops that require extensive processing and are marketed over a wide area may create an even greater income. Those crops largely consumed as produced may not have as high an income-creating character.

The combined value of all crops produced on reclamation projects since 1906 is almost $10 billion. The value to the Nation of the reclamation crop, however, may also be measured in terms other than monetary. Many of the crops produced under the ideal climatic and soil environment of the irrigated West are grown only there, and these choice fruit, nut, and truck crops provide a delightful and health-giving supplement to the Nation's diet.

Irrigated lands in the Western States produce virtually all of the Nation's apricots, almonds, walnuts, dates, lemons, figs, prunes, and olives. They supply about 95 percent of the grapes; 90 percent of the lettuce; 75 percent of the avocados, pears, and cantaloups; 65 percent of the asparagus; 50 percent of the peaches; and more than 50 percent of the commercial truck crops.

The significance of Federal reclamation in western and United States production is demonstrated also in the highly desirable off-season production of fruits and vegetables. The Gila, Yuma, Salt River, and Boulder Canyon projects alone, for example, produce over 97 percent of the United States-grown dates; 45 percent of winter and 42 percent of spring lettuce; 85 percent of the early spring cantaloups and 80 percent of early-summer cantaloups; over 85 percent of the spring carrots; and sizable portions of the Nation's supply of other choice protective vegetables and truck crops.

The traditionally important feed and forage plants of reclamation projects characterized operations in 1953 and made a substantial contribution to the utilization of the 700-million-acre western range. If not supplemented during some part of each year, the production potential of these rangelands could not be attained and the Nation would be deprived of a tremendous forage resource needed in the production of livestock and livestock products. During 1953, reclamation farms produced over 13.4 million tons of hay, pasture, forage, and cereals, a large part of which were utilized locally.

The second trade-creating aspect of reclamation is the purchasing power of project farmers and those securing income from the project's

production. It has been shown that the new income created at the local farm and nonfarm level is about 170 percent of the value of crops produced, or in 1953 over $1.3 billion. This income from labor, management, and property is the competitive market for all foods, clothing, building materials, household goods, cars, and all manufactured items of modern society.

The increased purchasing power of the Central Valley project in California provides an excellent case study of the influence of resource development on retail sales. This project alone through supplementing the water supply of many privately built and highly successful irrigation ventures and the irrigation of some new land is estimated to provide a new market for a million pairs of shoes each year, part of which will be made in Massachusetts, New York, Pennsylvania, or Missouri; for $10 million worth of tobacco products, which will come largely from North Carolina, Virginia, Kentucky, Florida, and Pennsylvania; for 8,000 vacuum cleaners, 8,000 refrigerators, 8,000 ranges, 8,000 washing machines, 8,000 radios and television sets which will come from many States but largely from Ohio, Michigan, Illinois, Connecticut, New Jersey, New York, and Pennsylvania.

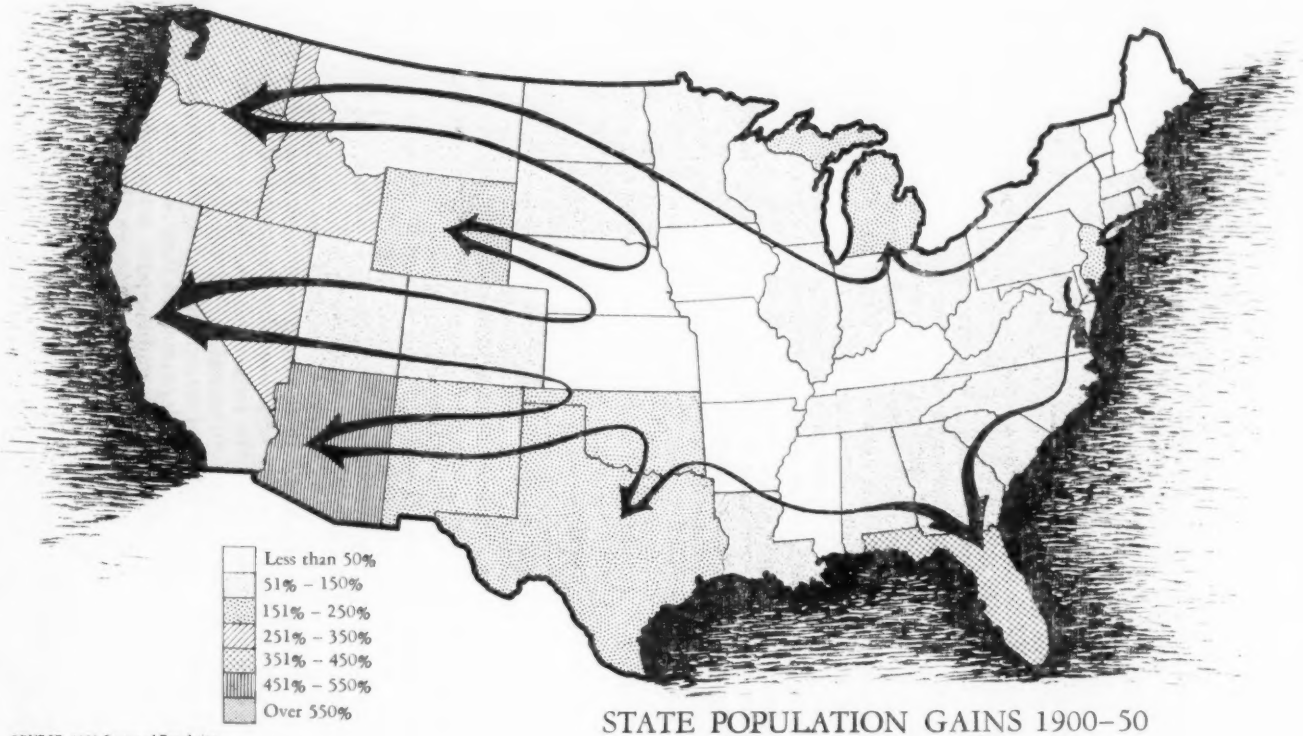
The increased purchasing power of this 1 project translates into an annual market for 15,000 new cars, some from Detroit and South Bend and other cities, but many assembled in California from parts manufactured in Michigan, Indiana, Illinois, Ohio, and Wisconsin; for hundreds of thousands of dollars' worth of textiles from New England and the South Atlantic States; and for thousands of automobile tires and accessories, home appliances, office machines, and all the assorted gadgets of the day produced in all corners of the country.

The water conserved and made available by this 1 project, although used largely to supplement the irrigation supplies of many thousands of prosperous farms, is enough to supply a fully adequate irrigation source for the equivalent of well over 6,000 new farms.

Such number of farms would require an initial investment in more than 8,000 tractors, 70 percent of which come from Pennsylvania, Illinois, and Wisconsin; more than 7,500 trucks fabricated in Michigan, Wisconsin, and Indiana, though perhaps assembled in California; around 1,000 hay balers, spray outfits, and combine harvesters, and so forth, produced mainly in Illinois, Wisconsin, Pennsylvania, Tennessee, Iowa, and New Jersey; and thousands of plows, harrows, cultivators, mowers, and other implements originating largely in the Great Lakes, East Central, and South Central States. Annual replacements will continue to provide an active market.

Every segment of the Nation's economy has participated and shared directly or indirectly in the construction of these reclamation projects. In doing so every section of the Nation has been benefited by reclamation long before the impact of prosperous and continuing consumer markets has been measured.

An analysis of direct Federal procurements for the Central Valley project in California, for example, indicated that all of the 48 States, the District of Columbia, and Hawaii supplied some portion of the $99 million Federal purchase. In like manner these many areas shared in purchases by the contractors of millions of dollars of materials, equipment, and supplies. The same pattern of nationwide procurements occurs in the construction of other reclamation projects.



SOURCE: 1950 Census of Population.
Bureau of Census, Department of Commerce.

STATE POPULATION GAINS 1900–50
National Average, 98.3%

IMPORTANCE OF RECLAMATION TO THE WEST AND TO THE NATIONAL ECONOMY

Growth of western population

The story of the phenomenal growth of our Nation is the story of the new frontiers it has conquered. The Ohio Valley, Louisiana Territory, California, the Oregon country, Alaska, and the persistent development of the resources of these and many other new frontiers have provided the Nation with the ingredients for economic growth.

From the Nation's beginning it was the resources from the new frontiers that nurtured it from economic infancy as a nation of farmers and woodsmen to the industrial giant it is today and made possible the population growth from the 5.3 million of 1800 to 161 million today. The phenomenal increase in western population clearly indicates the economic maturing of that vast area which a century ago was little more than the domain of cowboys, trappers, and Indians.

The rate at which this process is being accomplished is recorded in the latest census, which established the West as the most rapidly growing section of the Nation. Expressed in terms of the percentage increase of 1950 over 1940, the 17 Western States gained 25.8 percent, the 11 Mountain and Pacific States 40.9 percent, and the 3 Pacific States 48.8 percent, while the United States population increased only 14.5 percent.

In the 50 years between 1900 and 1950, the 17 Western States gained 204 percent, the 11 Mountain and Pacific States 378 percent, and the 3 Pacific States 499 percent, while the United States population did not quite double. The West is growing up and, in the process, is assuming more than ever a position of vast strategic importance in the Nation's future.

National trade and reclamation

The importance of the West as a market for the products of the East while at the same time serving as a major source of supply is apparent in the attached graphical presentation. A 1 percent sample study of waybills conducted by the Interstate Commerce Commission indicates that, in 1951, 1,544,300 cars weighing 39,820,200 tons were shipped into the 17 Western States from the 31 Eastern States and 2,210,400 cars weighing 71,927,900 tons were loaded in the 17 Western States for shipment to the 31 Eastern States.

In this single year machinery, merchandise, and equipment weighing 525,100 tons were loaded into 29,200 freight cars and shipped to the 17 Western States from the New England States. The Middle Atlantic States supplied 162,100 cars weighing 4,042,800 tons, and the East North Central area representing the industrial Great Lakes States an additional 608,000 cars weighing 13,353,000 tons for the 17 Western States area. The East South Central and South Atlantic groups provided 99,200 and 84,700 cars weighing 2,811,500 and 2,313,700 tons, respectively, for delivery to the 17 Western States area. Substantial shipments were made also from the other Eastern States not included in the above groups.

Internal shipments—those originating in the 17 Western States and shipped to others of the 17-State group or within the States themselves—produced an additional whopping load of 4,858,700 carloads aggregating 186,354,000 tons.

Spot checks of rail shipments to and from reclamation-project areas reveal an outstanding pattern of continuing prosperity. Railroad records at Basin, Greybull, Lovell, Powell, and Worland, Wyo. (the trade area of Shoshone project) show only 523 carloads of produce shipped out in 1910. By 1941 the produce shipment had increased to 11,793 carloads. The market for goods consumed in that area and produced in other parts of the country grew from 653 carloads in 1910 to 5,161 carloads in 1941.

In 1900, before irrigation began on the North Platte project in Nebraska and Wyoming, only 190 carloads of outgoing freight were shipped from Scottsbluff—the central trading point of the project in western Nebraska on the Burlington Railroad system. By 1910, as irrigation got underway, the fowardings increased to 1,306 carloads; by 1940 they had reached 2,404 carloads; and in 1942 they totaled 3,194 carloads.

The record of imports to this same North Platte area establishes an even more astounding pattern of growth. In 1900 only 283 carloads of goods from 6 States were consigned to Scottsbluff. In 1910, 14 States shipped 1,448 cars. By 1940 the market had increased to require 6,207 carloads from 37 States, and 7,144 carloads from 39 States in 1942. Checks of Burlington Railroad records have not been conducted since that time.

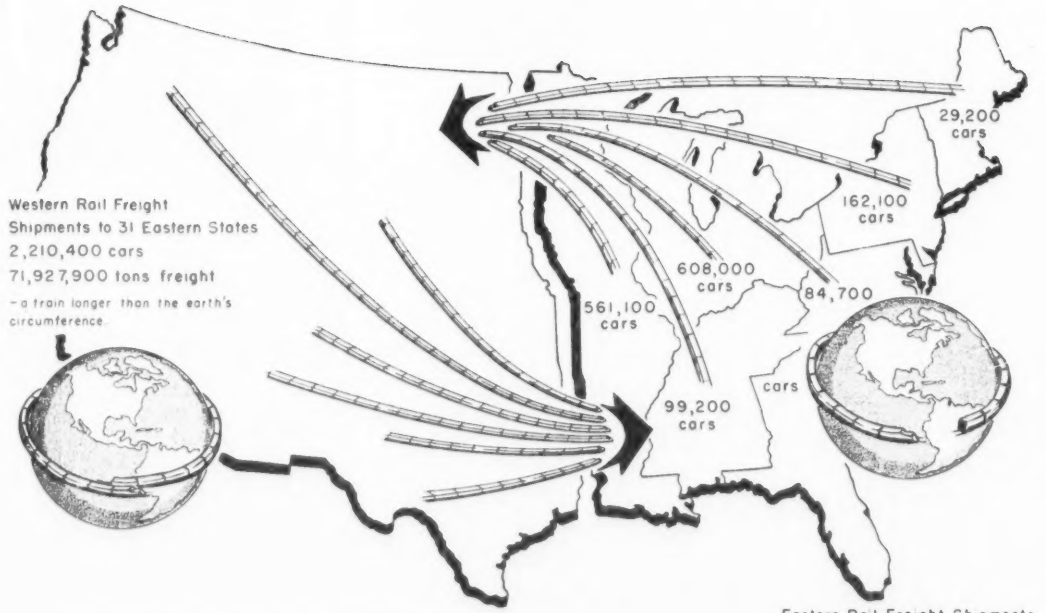
The constant growth of railroad shipments to and from Ada and Canyon Counties, Idaho, closely parallels the expansion of irrigation on the Boise, Owyhee, and Vale project areas served from the rail outlets of these counties. In 1951, a total of 4,929 cars from the 31 Eastern States and 10,632 cars originating in the 17 Western States were unloaded at Ada and Canyon County terminals. Total incoming shipments of 15,561 cars compare with an outbound total of 15,935 cars.

As reported in the ICC study, the Ada and Canyon County market received 46 percent of shipments into Idaho which originated in the 31 Eastern States and 18 percent of shipments into Idaho from other States in the 17 Western State group, or an overall average of 22 percent of total Idaho imports. The study shows Ada and Canyon County forwardings comprised a little over 11 percent of total Idaho out-bound shipments.

Significantly the carloadings and tonnage figures covered in the ICC report represent rail shipments exclusively, and do not prorate the 162 billion ton-miles of shipments carried by motor trucks in the Nation during 1951.

In 1952 the crops produced on reclamation projects weighed in excess of 23.6 million tons. The 1953 crops exceeded 25.7 million tons. Parts of these crops were shipped by rail to a consuming market not otherwise supplied by the choice fruits, nuts, and vegetables grown in the ideal climate and soil environment of the irrigated West. Other appreciable segments of the bounty of reclamation projects moved by truck. The flow of out-bound freight was matched by incoming trucks and railroad cars in reclamation-project areas loaded with the products of the mines, mills, and industries of the rest of the Nation. Trade in the 17 Western States was materially stimulated by reclamation projects. In turn the influence of the trade extended to all of the States of the Union.

Retail sales in the 17 Western States during 1951 rose to almost $40 billion and averaged out at $1,139 for every man, woman, and



IMPORTANCE OF THE IRRIGATED WEST
as a Market – and as a Supplier

(Figures from Interstate Commerce Commission 1951)

child. Retail sales for the Nation during the same year averaged $1,023 per capita. The average of the 11 Western States was $1,209 and the 3 Pacific States $1,240 per capita.

This retail market was nearly three times greater than the total United States exports for the same year and provided an outlet for the textiles of the East and New England, the technical equipment and machinery of the Middle Atlantic and New England States, the automotive equipment and farm machinery of the industrial Great Lakes States, the tobacco and tobacco products of the Southeast, and for the assorted goods and services offered to the retail trade by the multitude of suppliers in the Nation's markets. Much of the western market has been made possible by the establishment of prosperous communities upon irrigated land.

Each reclamation project exercises an influence on the local and regional market as evidenced by the $40 billion level of retail sales in the 17 Western States and through these markets reclamation's influence is carried into the markets of the Nation as a whole.

Summary of the local, regional, and national trade-creating activities resulting from construction, development, and operation of Federal reclamation projects

	Local	Regional	National
Construction stage..	Increased employment and increased payroll. Increased activity in real-property market. Rapid growth of retail business, both sales and plant. Stimulation of all local building trades and supply organization. Rapid increase in inbound shipments. Increased revenues from contractors and business taxes. Increasing tax base.	Increased wholesale trade. Stimulated plant expansion in all lines. Increased commission sales. Increased manufacturing. Increased demand on transportation facilities to accommodate inbound shipments. Some increase in tax payment.	Large key procurements stimulate heavy industry in construction, machinery, cement, timber, power, and other fields. Increased rail and truck shipments to manufacturer and to project. Some increase in tax payment.
Development stage.	Construction employees replaced by settlers. Increased farm machinery and equipment sales. Introduction of packing and processing services. Increase in settler durable-goods business. Balancing of in- and outbound shipments. Increased real property tax revenues. Operation and maintenance force established. Improved schools and all public utilities.	Expansion of wholesale and retail business. Commission business on both sales to settlers and sale of project goods. Balanced rail and truck shipments. Better ratio of total costs to services in schools, roads, etc. "Protective foods" produced on project start to become available.	Increased demand for farm machinery, appliances, and all forms of durable goods. Market for nondurable goods created by construction replaced and stimulated by permanent settlers. Balanced rail and truck shipment. Direct payments by project beneficiaries for project works. Increased Federal taxes. Increase in permanent economic base. "Protective foods" produced on project start to become available.
Operation stage.....	Stabilized and expended retail business at high levels. Permanent packing and processing services. Increased tax base. High attainments in education, public health, and other public service fields. Permanent communities.	Stabilized wholesale and retail trade at high levels. Expanded trade centers with commission houses, etc., handling the products of the project as well as goods consigned to project. Balanced rail and truck shipments. Improved ratios in public costs with respect to services provided. Higher tax base with greater tax revenues.	Increased dollar volume of consumer goods for greater project and regional market. Increased public revenues through taxation. Repayment of project costs from direct project revenues. Project produced "protective foods" available to Nation.

Distribution of population and retail sales, by State group and United States total

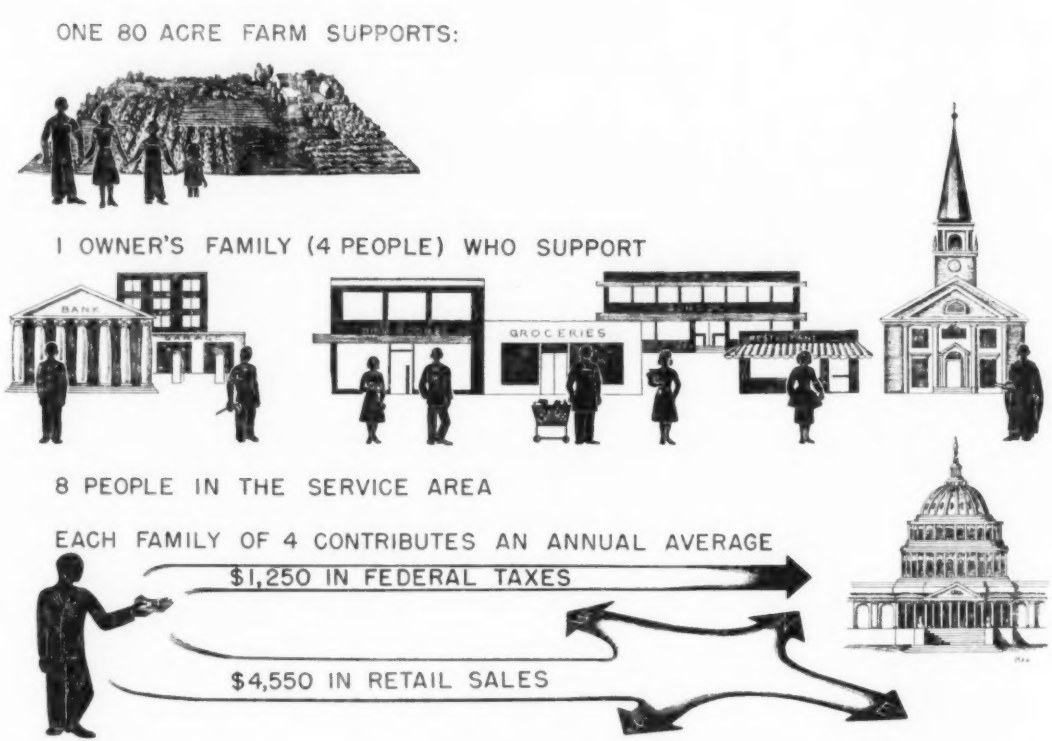
Item	United States totals or averages	31 Eastern States	17 reclamation States, by group		
			3 Pacific	11 Western	17 Western
Estimated 1952 population	152, 908, 600	118, 099, 300	14, 995, 900	20, 169, 600	34, 809, 300
Percent of United States population	100	77. 2	9. 8	13. 2	22. 8
Retail sales:					
Per person	$1, 023	$989	$1, 240	$1, 209	$1, 139
Total	$156, 439, 219, 000	$116, 799, 387, 000	$18, 590, 105, 000	$24, 394, 967, 000	$39, 639, 832, 000
Percent of United States sales	100	74. 7	11. 9	15. 6	25. 3

Source: Consumer Markets, SRDS, 1952-53.

Retail sales summaries, by State and State group, 1951

State and group	Estimated 1952 population	Estimated retail sales		
		Per house	Per person	Total
Arizona	775, 600	$4, 025	$1, 131	$876, 877, 000
California	10, 979, 100	4, 072	1, 282	14, 080, 171, 000
Colorado	1, 347, 000	4, 020	1, 188	1, 600, 192, 000
Idaho	595, 300	4, 080	1, 174	698, 711, 000
Kansas	1, 957, 900	3, 788	1, 149	2, 249, 394, 000
Montana	594, 300	4, 208	1, 251	743, 282, 000
Nebraska	1, 327, 000	3, 962	1, 179	1, 564, 659, 000
Nevada	165, 400	4, 769	1, 498	247, 836, 000
New Mexico	697, 500	3, 077	800	558, 245, 000
North Dakota	617, 500	4, 504	1, 179	727, 997, 000
Oklahoma	2, 233, 600	2, 955	878	1, 960, 829, 000
Oregon	1, 567, 000	3, 583	1, 129	1, 768, 865, 000
South Dakota	653, 700	3, 972	1, 113	727, 880, 000
Texas	7, 850, 000	3, 594	1, 021	8, 014, 106, 000
Utah	704, 000	3, 710	1, 013	713, 113, 000
Washington	2, 449, 800	3, 616	1, 119	2, 741, 069, 000
Wyoming	294, 600	4, 289	1, 244	366, 606, 000
Total, 17 Western States	34, 809, 300	.....	1, 139	39, 639, 832, 000

Source: Consumer Markets, SRDS, 1952-53.


ONE 80 ACRE FARM SUPPORTS:
1 OWNER'S FAMILY (4 PEOPLE) WHO SUPPORT
BANK
GROCERIES
8 PEOPLE IN THE SERVICE AREA
EACH FAMILY OF 4 CONTRIBUTES AN ANNUAL AVERAGE
$1,250 IN FEDERAL TAXES
$4,550 IN RETAIL SALES

GOVERNMENT COSTS AND REVENUES FROM RECLAMATION

Cost of construction

The total cost of project plant, property, and equipment for the Federal reclamation program, as of June 30, 1953, was as follows:

Item	*Costs*
Completed works:	
Multiple purpose	$872,292,822
Irrigation	581,151,447
Power	457,002,583
Municipal water	13,974,130
Flood control	10,619,508
Construction in progress	450,689,185
Other physical property	21,071,583
Total	2,406,801,258

Full production is yet to be obtained from some of the newer irrigation projects and very little has been obtained from the funds indicated for "Construction in progress."

The magnitude of these large figures is difficult to fully understand. A comparison of the costs of plant, property, and equipment for all reclamation since 1902 with the cost of other Federal activities may be helpful. The total cumulative cost of reclamation would finance the Department of Defense for less than a month at its fiscal year 1952 level of expenditure. What has been spent on reclamation in over 50 years would finance our aid to foreign countries only half of a year. What was spent on reclamation in the 1 year, fiscal year 1953, would have financed the Department of Defense less than 3 days, the foreign assistance program or the Veterans' Administration less than a month.

Reclamation, in its more than 50-year history, has spent in plant, property, and equipment the equivalent of only about 4 percent of our current annual national budget. In perspective, the annual reclamation expenditures become relatively small when measured in terms of benefits to all segments of the Nation.

INCOME FROM IRRIGATION AND POWER

The total of repayment contracts with irrigation districts and municipalities as of June 30, 1953, amounted to $691 million, of which $109 million have been paid. Additional amounts will be returned under water-service-type contracts. In addition, water users are paying the annual costs of operating and maintaining the project works.

Net power revenue from sales of energy produced by the 29 plants in operation, after deductions for annual operation, maintenance, and replacements, totaled $225.9 million on June 30, 1953, of which $33.8 million was received during fiscal year 1954. These facilities will continue to be revenue-producing for many years and as they are integrated with additional plants to be brought into operation, the efficiency and revenue-producing characteristics will be greater than at present. At the level of net power revenues for fiscal year 1954, these 29 plants could return to the United States Treasury during the next 50 years at least $1,692 million.

Of the potential income of $1,918 million in net power revenues by year 2003 from the 29 powerplants in operation and the $691 million from irrigation and municipal water during the repayment contract period, there had been returned to the Federal Treasury through June 30, 1953, a total of $334.8 million.

FEDERAL TAX REVENUE CREATED BY RECLAMATION

In 1953, individual income taxes paid directly by irrigation farmers and by persons of the neighboring towns and villages whose business or employment stems from the construction of 15 selected reclamation projects, were estimated at $106 million. The cumulative individual income tax revenues from this sample study area since 1916 is estimated at over $800 million. In addition to individual tax revenues, an appropriate share of corporation and excise tax revenues collected in the same 15 project areas is directly attributable to reclamation development. Estimated receipts from these sources total nearly $500 million. The combined returns from individual and corporate tax revenues accordingly are estimated at about $1.3 billion. Total Federal project construction cost through June 30, 1953, for the same projects aggregated $269 million. Thus far, Federal taxes collected have exceeded the Federal investment in irrigation features in these projects by about five times.

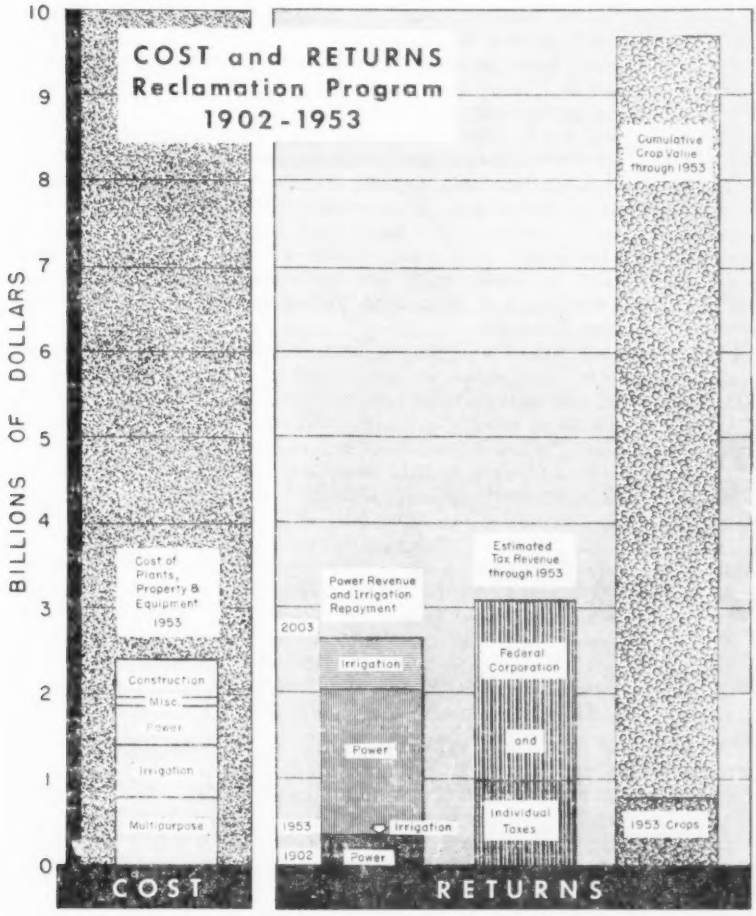
Based on this sample study, the cumulative return to the Treasury from the areas of the 69 projects or divisions of projects receiving water under the Federal reclamation program in 1953 now stands at over $3.1 billion. This is an amount greater than total reclamation expenditures for all project works either complete or incomplete since the beginning of the Federal reclamation program in 1902 to 1953. It has accumulated from projects involving less than half of total irrigation feature costs incurred to date and thus presages accelerating revenues as the great projects of the Columbia Basin, Missouri River Basin, and Central Valley of California reach full production. Strikingly enough, these revenues are in addition to the obligation voluntarily assumed by direct users of water to repay to the Government the cost of irrigation features allocated for repayment.

Long after project costs have been repaid fully through the sale of electric energy and operations of repayment contracts, the new wealth created through the Federal investment in the development of its own resources will be reflected in a continuing flow of tax revenues from the project areas and from the rest of the Nation as well.

NATIONAL NEED FOR AN EXPANDING RECLAMATION PROGRAM

Rising national population and need for food and fiber

Since 1920, the land used for crops in the United States has remained at approximately 400 million acres. During the last half century, the acreage of cropland available per capita has constantly decreased. In 1900 there were 4.2 acres for each person; by 1950, 2.7 acres. With fewer acres per person, we are living better than 25 or 50 years ago.



This miracle has been aided by farm mechanization, development of synthetic fibers, and the shift in the export and import balance. The equivalent of 50 to 60 million acres of new land has become available by the replacement of horses and mules with tractors. Proportionate equivalent additions resulted through discovery and production of synthetic fibers and the shift in trade balance. Mechanization is virtually complete. We have reached what appears to be the point of minimum cotton requirements, and production has increased in the interest of national well-being. We have become a balanced agricultural nation in terms of exports and imports. Additional relief cannot be anticipated from those sources.

Against this backdrop of agricultural adjustments, we face a future which will see 6,000 more persons each day surround the dinner table

and our population surge upward to 200 million by 1975. Where four surround the dinner table, a fifth will join by a quarter of a century. Present farm production will not provide for that fifth person if we are to live as well as we do, allow for desired improvements, and take care of national commitments.

This does not imply that Americans will go hungry in the next 15 or 25 years. Farm output has been stepped up. As a nation we have improved irrigation and applied it to over 26 million acres in the production of more and finer crops. Most of this land was reclaimed from the desert. We have used better seed and planting stocks, more fertilizer, and many tools of soil conservation and better husbandry to make each acre produce more. The Nation will meet the challenge of increased population by continuing and accelerating these processes.

The equivalent of 100 million new acres must be developed. Much of this will come from more intensive use of land we now farm, a part will come through new irrigation projects in the arid West. But perhaps the most productive potential source will come through making irrigation available where rainfall is unreliable or inadequate.

Farmers in the so-called humid area are finding crop production can be greatly increased by supplemental water during recurring periods of drought and that adequate soil moisture increases the efficiency of crop rotation and commercial fertilizers. Interest in irrigation in the higher rainfall areas is proven by a 96-percent increase in land irrigated in the 10-year period, 1939 to 1949, in the 31 Central and Eastern States, compared to an increase of 21.9 percent in the 17 Western States. There are now about 1,500,000 acres of irrigated land in these Eastern States. As this pattern continues, there will be greater interest in the optimum use of water and land resources.

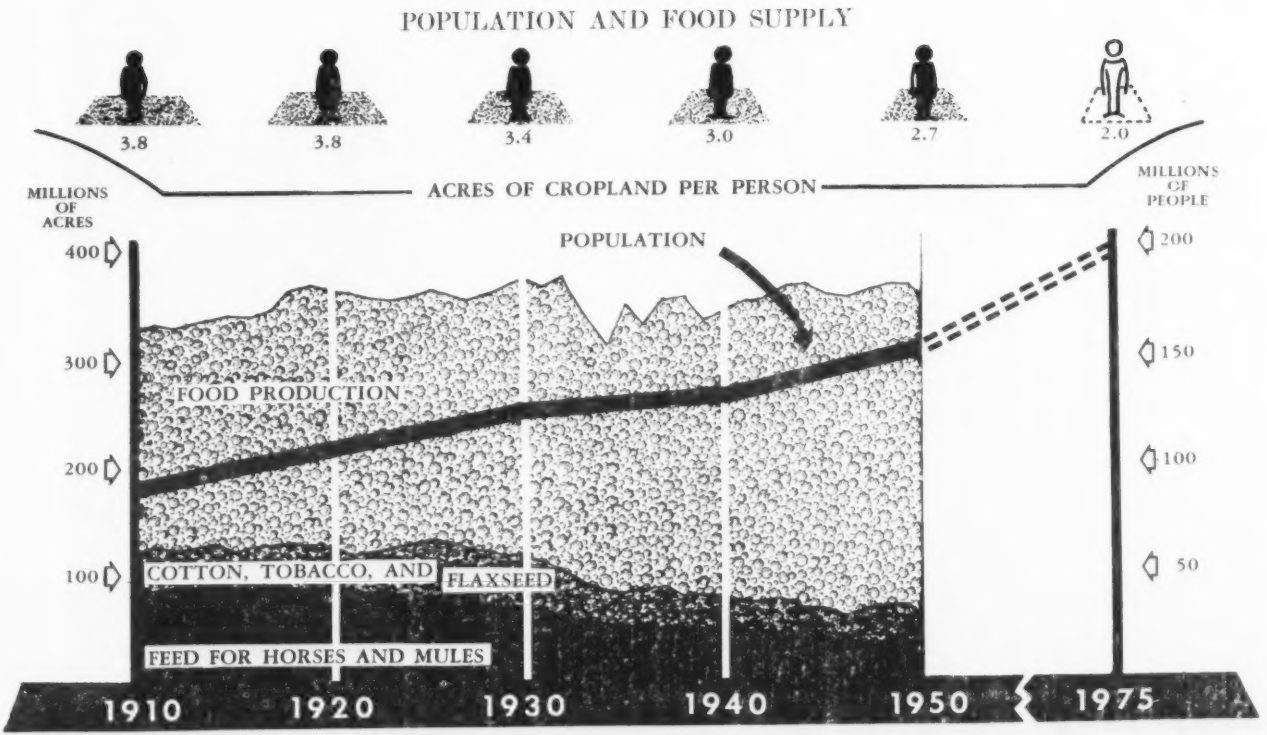
Other needs for development of water resources

The need for food for a growing population is only a part of the need for water developments. Water is essential to every aspect of our lives in quantities that are usually unsuspected. For example, it takes 18 barrels of water to refine a barrel of oil. It takes 85,000 gallons of water to produce a ton of rubber, and 800,000 gallons to grow a bale of cotton. Municipal needs for water average about 200 gallons a day for each person.

It was once assumed that the eastern half of the Nation had plenty of water, yet many cities are now facing water shortages and industries using large quantities of water are searching for areas with adequate supplies. More and more farmers are interested in supplemental irrigation. The "water problem" is no longer confined to the arid West.

Our increasing population must find an increasing field of economic opportunity. The development of new water resources can be used as a foundation on which an expanding economy can be constructed.

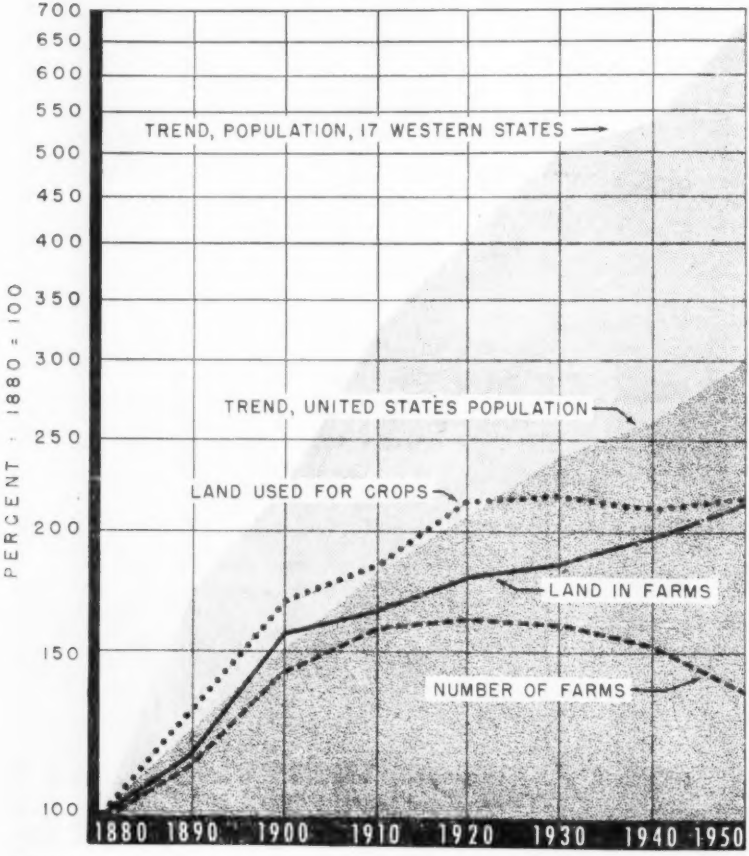
As an example, in addition to the opportunity for irrigation development other opportunities exist for the development of water resources in the upper Colorado Basin. Here are 17 percent of the world's coal resources. Much of it can be developed as a source of synthetic oil. This reserve would supply the Nation's present consumption of oil for hundreds of years. The oil-shale deposits would supply the


POPULATION AND FOOD SUPPLY
3.8
3.8
3.4
3.0
2.7
2.0
ACRES OF CROPLAND PER PERSON
MILLIONS OF ACRES
MILLIONS OF PEOPLE
POPULATION
400
300
200
100
200
150
100
50
FOOD PRODUCTION
COTTON, TOBACCO, AND FLAXSEED
FEED FOR HORSES AND MULES
1910
1920
1930
1940
1950
1975

present national consumption for 190 years. Vast deposits of uranium, vanadium, magnesium, and phosphate are available for use. The development of water and its power potentials would lead the way to a vast industrial expansion.

The development of water and hydroelectric power over the Nation tends to disperse the population and industry, reduce the burden of transportation, and make sections of the Nation more self-sufficient. This could be an important factor in an atomic war or other national emergency.

POPULATION TRENDS compared with AGRICULTURAL DEVELOPMENT 1880-1950



SOURCE: Census of Agriculture and Census of Population, Bureau of Census, Dep't of Commerce

RECLAMATION'S POTENTIAL

From time to time estimates have been made of the reclamation potential of the Nation. Each of these estimates has been influenced by the concept of need, engineering technology, and the economic criteria existing at the time.

Millions of acres of desert land, ideal for irrigation, are now unused except for limited grazing. Millions of acres of land are now farmed that cannot produce at their optimum level due to shortages of moisture at some time during the growing season. As these water needs for agriculture and those of our cities and industries continue, we allow our rivers to flow relatively unused to the oceans. The Geological Survey estimates that the Nation uses only 14 percent of the annual runoff. Other estimates indicate that 400 million acre-feet of water from the 17 Western States waste virtually unused to the ocean. The day is far in the future when the Nation will irrigate every acre of land than can be economically irrigated and will use all its water resources beneficially.

What are the limiting factors to a continuing development of our land and water resources? There is no doubt a limit to these resources but it cannot be reached in the foreseeable future.

Is the limiting factor our engineering ability? In this field the impossible of yesterday is commonplace today and progress has exceeded our ability to comprehend. No project that has been proposed is beyond the engineering skill of the day.

The only limitation to continued resource development is the relationship of the need to the cost at any given time. What is the value of a glass of water? What is the value of food? It is in relation to the need and the need is an ever-changing factor. We should set about to provide for the needs of tomorrow so that when tomorrow comes we are not too late with too little.

We need vision to see the needs of tomorrow and the opportunities that are around us to provide for them. This vision is not present in all men, even men of learning and leadership. Some early explorers called the Great Plains and Southwest the American desert.

In 1852, Daniel Webster, speaking against western railroad development said:

> I will not vote one cent from the Public Treasury to place the Pacific Ocean 1 inch nearer to Boston than it is. What do we want with this worthless area—this region of savages and wild beasts, of shifting sands and whirlwinds of dust, of cactus and prairie dogs? To what use could we ever hope to put these great deserts and these endless mountain ranges?

Fortunately for the Nation, other men could see the great potential of the West. Many now see a continuing Federal reclamation program as a means of insuring an adequate supply of food and fiber for our increasing population, as a base for the development of unused resources, as a means of extending and widening the national horizon of new economic opportunities for our people, and as a leavening agent for our continued national economic growth.

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